STATEMENT OF WORK FOR CONDUCTING A REMEDIAL INVESTIGATION AND FEASIBILITY STUDY AT THE EAGLE ZINC COMPANY SITE, MONTGOMERY COUNTY, ILLINOIS

EPA Revision #1 - 10/16/01

This document is the Statement of Work (SOW) for conducting a Remedial Investigation (RI) and Feasibility Study (FS) at the Eagle Zinc Company Site, located in Montgomery County, Hillsboro, Illinois. The purpose of this SOW is to provide the direction and intent of the RI/FS. Within ~~45~~ 90 days of the effective date of the Consent Order, a RI/FS Work Plan will be submitted that provides detailed guidance on the execution of the RI/FS.

The purpose of the RI is to investigate the site's physical characteristics, identify the sources of contamination, and determine the nature and extent of contamination at the Eagle Zinc Company Site. The purpose of the FS is to develop and evaluate remedial action alternatives based on the RI data and report. All personnel, materials, and services required to perform the RI/FS will be provided by the Potentially Responsible Parties (PRPs).

The tasks described herein are grouped into the following three categories:

- Plans and Management,
- Remedial Investigation (RI), and
- Feasibility Study (FS).

The Work Plan developed pursuant to this SOW will present a phased, iterative approach that recognizes the interdependency of the RI and FS. The primary intent of the phased approach is to minimize the need for conducting post-FS or supplemental RI/FS activities by thorough characterization of the migration pathways and early identification of the site specific data requirements associated with the applicable remedial technology.

Brief discussions of the major RI/FS tasks are presented, by major topical categories, in the following sections.

I.

PLANS AND MANAGEMENT

A. TASK 0 - RI/FS WORK PLAN PREPARATION

A RI/FS Work Plan will be prepared for the Eagle Zinc Company Site that details the technical approach, personnel requirements, and schedule for each task described in this SOW. The schedule will show the implementation of tasks and submission of deliverables in weeks subsequent to regulatory (~~e.g.,~~ U.S. EPA, in consultation with ~~and~~ IEPA) approval and acceptance of prior deliverables. Incorporated into this Work Plan will be the following specific plans (some or all of these submittals may be combined into a single deliverable):

1. Field Sampling Plan

A Sampling Plan that addresses all data acquisition activities will be prepared. The plan will contain a statement of sampling objectives and equipment specifications, required analyses, sample types, and sample locations and frequency. The plans will address specific hydrologic, hydrogeologic, and air transport characterization methods including, but not limited to, geologic mapping, geophysics, field screening, drilling and well installation, flow determination, and sampling. The application of these methods will be described for each major subtask within the site investigation (e.g., waste characterization, migration pathway assessment, and contaminant characterization).

In addition, the plan will identify the data requirements of specific remedial technologies that may be necessary to evaluate remedial alternatives in the FS. It will include an evaluation explaining what additional data are required to ~~adequately characterize the site, evaluate the no-action alternative, and~~ support the feasibility study. ~~It will provide a schedule stating when events will take place and when deliverables will be ready.~~

2. Quality Assurance Project Plan

A Quality Assurance Project Plan (QAPP), prepared in accordance with current U.S. EPA guidance, will be appended to the Sampling Plan. The QAPP will describe the project and project personnel organization and responsibilities. It will include quality assurance objectives for data (precision, accuracy, completeness, representativeness, comparability, and intended use) and specify sampling procedures, locations, parameters, number of samples, and sample custody.

The QAPP will specify the type and frequency of calibration procedures for field and laboratory instruments; the type and frequency of internal quality control checks; the type and frequency of quality assurance performance audits and system audits; the preventive maintenance procedures and schedule; specific procedures to assess data precision, representativeness, comparability, accuracy, and completeness of specific measurement parameters, and corrective action

procedures for field and laboratory instruments.

The QAPP will also describe how the data will be documented and tracked, including documentation materials and procedures, financial reporting procedures, and documents.

3. Health and Safety Plan

A Health and Safety Plan to protect the health of personnel involved in site activities and the surrounding community, will be developed on the basis of site conditions and be consistent with the following regulations and guidance:

- 20 CFR 1910.120 (i) (2) - Occupational Health and Safety Administration: Hazardous Waste Operations and Emergency Response, Interim Rule, December 19, 1986.

- U.S. EPA Order 1440.2 - Health and Safety Requirements for Employees Engaged in Field Activities.

- U.S. EPA Order 1440.3 - Respiratory Protection.

- U.S. EPA Occupational Health and Safety Manual.

- U.S. EPA Interim Standard Operating Procedures (September, 1982).

The health and safety plan shall provide information on provisions to protect site visitors, personnel responsibilities, protective equipment, procedures, protocols, decontamination methods, and medical surveillance.

4. Risk Assessment Plan

A Risk Assessment Plan will be developed quantifying the risks posed by the Eagle Zinc Company Site and analyzing the public health impacts of the remedial alternatives. The methodology presented in this plan will conform to the Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (1991) and any current EPA guidance. The risk assessment plan shall also include the preparation of an ecological risk assessment consistent with current EPA guidance.

5. Data Management Plan

A Data Management Plan will be developed to document and track investigative data and results.

The plan will identify and establish laboratory and data documentation materials and procedures, including laboratory certification information for purposes of demonstrating consistency with CLP procedures and requirements, project file requirements, and project-related progress reporting procedures and documents.

B. PREPARATION AND SUBMISSION OF PLANS

The preparation of the ~~project plans~~ workplan will be preceded by an evaluation of the existing information and initiation of investigative support activities (Task 1).

The Work Plan will be submitted in accordance with the schedule defined in Section VIII (Work to be Performed) of the Consent Order. Specifically, the RI/FS Work Plan will be developed and implemented in conformance with all provisions of the Consent Order, this SOW, and the standards set forth in the following statutes, regulations, and guidance:

- o Section 121 of SARA,
- o U.S. EPA "Guidance on Remedial Investigations under CERCLA," dated October 1988, as amended,
- o U.S. EPA "Guidance on Feasibility Studies under CERCLA," dated October 1988, as amended,
- o The National Contingency Plan, dated November 1985, as amended, and
- o Any additional guidance documents provided by the U.S. EPA.

II.

REMEDIAL INVESTIGATION

A. Objectives

The objectives of the RI are to:

- o Characterize the source(s) of potential contamination;
- o Characterize the hydrogeologic setting to

determine the most likely contaminant migration pathways and physical features that could affect potential remedial actions;

- o Determine the migration rates, extent, and characteristics of any contamination that may be present at the site: and

- o Gather data and information to the extent necessary and sufficient to quantify the risk to public health and the environment and to support the development and evaluation of viable remedial alternatives in the FS.

B. Scope

The scope of the Remedial investigation consists of six tasks:

Task 1: Description of Current Situation and Investigative Support

Task 2: Site Investigation

Task 3: Site Investigation Analyses

Task 4: Bench/Pilot Testing Studies

Task 5: Reports

Task 6: Community Relations Support

Each of these tasks is described in the following sections.

TASK 1 - INVESTIGATIVE SUPPORT AND DESCRIPTION OF CURRENT SITUATION

1. ~~Information and Data Gathering~~ Investigative Support

a. Site Mapping

Prepare an accurate topographic map of appropriate working scale. A base map of the site with a scale of 1 inch to 100 feet (1" - 100') and 2-foot contour intervals will be prepared from this

topographic map. The base map will illustrate the locations of wetland areas, floodplains, surface water features, drainage patterns, tanks, buildings, utilities, paved areas, easements, right-of-ways, and other pertinent features. Larger scale maps will be produced from the base map as necessary.

In addition to the topographic map, a grid plan will be prepared using the base map and grid overlay. This grid plan will show the location of existing monitoring wells, sampling locations for soil, groundwater, surface water and sediment, ~~and~~ water supply wells, and underground utilities. These maps will require surveying to establish horizontal and vertical controls for sites of the work relative to the National Geodetic Vertical Datum of 1929.

Review and verify in the field the legal description of the property. The intent is not to perform a boundary survey, but to locate the boundaries so that future activities do not carry over onto adjacent property without proper permission.

b. Metes and Bound

Assemble a legal description of the site from existing county and township records and results of the site survey.

c. Access Arrangements

Make the necessary arrangements to guarantee access to the site and surrounding parcels. These arrangements will include negotiating access agreements with landowners and obtaining demarcation clearance for all buried utilities and construction of access roads. The PRPs and their attorneys and consultants will be responsible for obtaining access permission for all off-site inspections and sampling locations. Eagle Zinc facility personnel may act as a local contact in this regard. However, if initial attempts at obtaining off-site access are unsuccessful, the PRPs will seek EPA assistance.

d. Preparation of Support Facilities

Initiate and implement the necessary arrangements to construct support facilities and/or procure the equipment necessary to performing a hazardous site investigation. This includes preparation of decontamination facilities, utility hook-ups, and site access control stations.

e. Obtaining tax maps and other information for local authorities

f. Identification of any accessibility issues for heavy equipment used in sampling

2. ~~Description of Current Situation~~ Preliminary Site Evaluation and Report

Gather and describe the background information pertinent to the site and its environmental

concerns, further detailing the purpose of the RI. The data gathered during previous investigations will be reviewed and evaluated. Regional information will be obtained from available USGS and State of Illinois Geologic Survey reports. The existing site information to be reviewed will include but not necessarily be limited to:

- o Illinois Department of Natural Resource and Environmental Protection Agency files.
- o Illinois County Soil Conservation Service reports.
- o Aerial photographs.
- o Historical water quality data.
- o U.S. and State of Illinois Geological Survey files.
- o Disposal records (if available).

In addition to this literature search, on-site activities may be used to confirm and/or update certain information. For example, existing monitoring wells may be inspected to determine if they are functional and the location and status of selected water supply wells field verified.

~~2. Preparation of Preliminary Site Evaluation Report~~

Information and data that are gathered during these initial steps will be used to generate a preliminary Site Evaluation Report that will address the following:

a. A summary of the site background that includes the pertinent boundary conditions, general site physiography, hydrology, and geology as well as a complete history of waste disposal activities and ownership transfer on the site. The waste disposal history shall also include identification of waste piles present at the site, their location on the site map, their origin and constituent characteristics, and any existing sampling results which can be used to distinguish different pile contents and group similar contents. This history shall include all known information regarding manufacturing practices that generated each waste pile, any current off-site disposal plans, and any proposed reconsolidation procedures coupled with justification for such procedures. This information will be used to design appropriate sampling protocol for pile sampling and shall include the evaluation of the potential for airborne emissions to migrate away from the piles as well as to identify any areas that have been impacted by pile emissions which may need subsequent confirmatory sampling.

b. The nature and extent of the problem that includes a summary of actual or potential on-site and off-site health and environmental effects. This report will emphasize threats or

potential threats to the public health.

c. The history of response actions that includes a summary of response actions conducted by local, state, or private parties.

d. A definition of boundary conditions that includes site boundary conditions that limit the areas of investigation. The boundaries will be set so that the on-site activities will cover the contaminated media in sufficient detail to support the FS. Boundaries for site access control and site security will also be identified. The boundaries of the study area may or may not correspond to the property boundaries.

e. Identification of potential receptors that includes the identification of private and public water supply wells within a two mile radius of the site. If possible, obtain the well construction details for these wells and other private water supply wells that may have been previously sampled and prepare a table summarizing the known construction details to submit with the original drilling logs.

f. Develop a site conceptual model that includes a description of the physical site conditions as to geology, meteorology, hydrology and hydrogeology. All subsequent site investigation activities will refine and validate this model. The conceptual model will focus on the groundwater flow system and will be based on the depositional history, inferred recharge and discharge mechanisms, estimated topographic and hydraulic gradients, and existing and last land use patterns.

g. A visual inspection of the extreme northern and western portions of the site property (historically unused areas) for locations of any residue and disturbed areas.

The Investigative Support and Description of Current Situation (Task 1) will be conducted prior to, or concurrent with, the Work Plan Preparation (Task 0). The Preliminary Site Evaluation Report will be submitted ~~as supporting documentation with the Work Plan~~ .45 days after the effective date of the Consent Order.

TASK 2 - SITE INVESTIGATIONS

Investigations necessary to characterize the site and its actual or potential hazard to public health and the environment will be conducted and result in data of adequate technical content to support the development and evaluation of remedial alternatives during the FS. Investigation activities will focus on problem definition and data to support the screening of remedial technologies, alternative development and screening, and detailed evaluation of alternatives.

The site investigation activities will follow the Plans set forth in Task 0. All sample analyses will be conducted at laboratories following EPA protocols or their equivalents. Strict chain of custody procedures will be followed, and all samples will be located on the site map (and grid

system) established under Tasks 0 and 1. A description of the types of investigations that will be conducted is presented below.

In the following descriptions of sampling approaches and methodologies, all discussions of the number and types of samples to be taken are current best estimates. The RI/FS workplan will provide that the actual number and types of samples will be adjusted as necessary, based on evaluation of data developed as field work proceeds. If the initial sampling approach is not adequate to meet the SOW objectives or to support assessment of remedial alternatives, further sampling will be proposed and will be implemented as approved by EPA, in consulation with IEPA.

A. Phase 1 Source Characterization and Preparation of Technical Memorandum

Investigations necessary to characterize the site and its actual or potential hazard to public health and the environment will be conducted and result in data of adequate technical content to support the development and evaluation of remedial alternatives during the feasibility study. Investigation activities will focus on problem definition and data to support the screening of remedial technologies, alternative development and screening, and detailed analysis of alternatives.

The site investigation activities will follow the plans discussed above. All sample analyses will be conducted at laboratories following EPA CLP procedures or their equivalents. Strict chain of custody procedures will be followed, and all sample locations will be located on the site map (and grid system). A description of the types of investigations that will be conducted is presented below.

The first phase of investigation will be carried out to characterize the physical and chemical aspects of the residue waste piles and potential soil and sediment contaminant source areas. The investigation of these source areas will involve obtaining data related to:

> Characteristics (e.g., type, quantity, chemical and physical properties, and concentrations) of residual materials generated by site manufacturing practices.
>
> On-site soils and on-site/off-site sediments. The physical and chemical concentration characteristics of on-site soils and drainage way sediments will be evaluated.

This information will be obtained from a combination of existing site information, field inspections, and site sampling activities. The source characterization will culminate in the preparation and submittal of a technical memorandum for the Phase 1 investigation activities. This technical memorandum will summarize the findings of the source characterization and may be used to refine the scope of the Phase 2 investigation activities outlined below.

1. <u>On-site soils investigation</u>

It is estimated that a minimum of 130 shallow soil borings will be needed in on-site areas to characterize and delineate the extent of organic and inorganic contaminant concentrations at the site. The majority of soil borings will be completed in the areas previously identified as Areas 1 through 4 with a minimum of 25 borings per area.. Soil borings will also be completed in the manufacturing plant area and in the historically undeveloped northern and western portions of the site property. A minimum of ten soil borings will be completed in each of these three areas.

Soil samples may be screened on-site for metals using a portable X-ray fluorescence (XRF) analyzer. The XRF results will be used to identify samples that will be retained for metals analyses, as well as to identify locations and depths of additional soil borings.

Approximately 20% of the soil samples will be retained for laboratory analysis and that the soil samples will be analyzed for the full suite of Target Analyte List (TAL) metals.

The soil samples will also be screened for organic vapors at the same time as the XRF screening mentioned above. Approximately 10% of the total soil samples will be retained for a more comprehensive suite of analytes including Target Compound List (TCL)and TAL analytes, and shall include pesticides and PCBs.

2. Residue Waste Pile Sampling

Each discrete waste pile will be evaluated by collecting representative samples in accordance with SW 846 procedures and testing the samples for inorganics using the Toxicity Characteristic Leaching Procedure (TCLP). The samples will be collected from trenches excavated to the base of the piles.

3. Sediment Investigation

A sediment investigation will be conducted in on-site and off-site portions of the storm water and surface water drainage systems that originate on-site or enter the site from adjacent properties. The principal objective of the sediment investigation will be to characterize the nature and extent of inorganic impacts on sediments in the drainage systems. The samples will be collected as transect composites at sediment accumulation points or at representative locations in the drainage ditches/streams on-site and off-site and screened for metals using the XRF analyzer and for organic vapors.

A minimum of 16 sediment samples will be collected for laboratory analyses and all sediment samples will be analyzed for TAL metals. Approximately 25% of sediment samples will also be analyzed for a more comprehensive suite of analytes including TCL compounds and pesticides/PCBs. The initial phase of sampling shall include collection of a sediment sample at or near the confluence of the eastern drainage ditch with Lake Hillsboro.

B. Phase 2 - Migration Pathway Assessment

The second phase of investigation will consist of a migration pathway assessment. The potential migration pathways at the site consist of groundwater and surface water. The migration pathway assessment will culminate in the preparation and submittal of a Phase 2 technical memorandum describing the findings of the Phase 2 investigations. The Phase 2 investigations are expected to including the following activities:

1. Installation of temporary monitoring wells.

A series of temporary monitoring wells/piezometers will be installed in the southwestern portion of the property, in the manufacturing plant area, and in the northern and western portions of the site. The temporary wells will be used to 1) provide information concerning the hydraulic relationship between the shallow groundwater and the southwest pond; 2) better characterize the pattern of shallow groundwater flow on-site and off-site; and 3) assist in the identification of locations for additional permanent monitoring wells. A minimum of 20 temporary wells will be installed, 10 in the southwestern portion of the site, four in the manufacturing area and three in both the the northern and western portions of the site.

Groundwater screening samples may be collected from selected temporary wells to assist in the identification of locations for installation of additional permanent monitoring wells.

2. Installation of additional permanent monitoring well

A minimum of ten of the temporary wells will be converted to permanent monitoring wells. The locations of the permanent wells will be determined based on the analytical results of the groundwater screening samples and the groundwater flow patterns at the site. A minimum of four permanent wells will be installed in the southwestern portion of the site, three in the manufacturing area, two in the northern portion of the site, and one in the western portion of the site.

3. Groundwater sample collection and analysis

Following the completion and development of the permanent monitoring wells, all existing and newly installed monitoring wells will be sampled for TAL metals. The metals analyses will be conducted using filtered and unfiltered samples to determine total and dissolved metals concentrations. In addition, a minimum of four samples will be analyzed for a more comprehensive list of parameters (TCL/TAL), including pesticides/PCBs. A complete round of water level measurements will be made to allow for the construction of a site-wide groundwater elevation contour map.

4. Surface water evaluation

An evaluation will be made of potential on-site sources of storm and surface water impacts and potential locations of surface and storm water discharges. Surface water samples will be

collected at the same locations as the Phase 1 sediment samples were collected from, however, results of the Phase 1 sediment sampling will be used to determine final Phase 2 surface water sampling locations. Samples near the outfalls 001 and 002 will also be included in this sampling exercise as they are not routinely sampled under the site NPDES permit.

C. Preparation of Risk Assessment Report

Based upon the specific chemicals and ambient levels at the site, the number and location of the surrounding population, and migration pathways, a second report, the Risk Assessment, will be conducted by the responsible parties to evaluate the actual or potential threat to human health, welfare, or the environment. Actual or potential risks will be quantified whenever possible. A general outline of work for the Risk Assessment follows:

- Select target chemicals for evaluation based on their degree of contribution to the risks associated with the site.

- Conduct exposure assessments that include the identification of acute and chronic hazards of concerns and the population(s) at risk.

- Evaluate existing toxicity information and determine the potential acute and chronic effects of the site contaminants as well as the specific effects such as carcinogenicity, reproductive dysfunction, teratogenicity, neurotoxicity, and other metabolic alterations; and environmental effects of aquatic and terrestrial toxicities.

- Assess impact by identifying acceptable exposure guidelines or standards, comparing estimated doses with these guidelines or standards. For target chemicals at the site that are designated as carcinogens by EPA, use EPA's evaluations to estimate the increased cancer risks.

This assessment will be conducted in accordance with the procedures described in the Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (1991) and any current guidance. A written report documenting the Risk Assessment methodologies and results should be submitted to U.S. EPA for approval pursuant to the schedule attached to this Statement of Work. ~~provisions of the Consent Order.~~ The risk assessment shall also include the preparation of an ecological risk assessment consistent with current EPA guidance.

An investigation will be carried out to characterize the physical and chemical aspects of the waste materials and the materials in which they are contained. The investigation of these source areas will involve obtaining data related to:

- o Waste characteristics (type, quantity, chemical and physical properties, and concentrations) and

- o Facility characteristics (type and integrity of containment, leachate collection systems, and drainage control).

This information will be obtained from a combination of existing site information, field inspection, and site sampling activities. Field investigations may be necessary to determine the integrity of the landfill covers.

The source characterization will culminate in the preparation and submittal of a Technical Memorandum. This memorandum will summarize the findings of the source characterization and will recommend parameters, or classes of parameters, that will be the focus of subsequent contaminant characterization studies.

b. Migration Pathway Assessment and Preparation of Technical Memorandum.

The migration pathways at the Eagle Zinc Company Site will be physically characterized through the following types of investigations:

Hydrogeology - A hydrogeology study will further evaluate the subsurface geology and characteristics of the water bearing formations. This study will define the site hydrostratigraphy, controlling geologic features, zones of preferential groundwater transmission, and the distribution of hydraulic heads within the water bearing formations. The results of this study will be combined with the existing site data described in the preliminary site evaluation report, and the results of the source characterization, to define the groundwater flow patterns and to predict the vertical and lateral extent of contaminant migration. These predictions will form the rationale for locating and designing monitor wells and the subsequent contaminant characterization.

Hydrology - Drainage patterns and runoff characteristics will be evaluated for potential erosional transport. Staff gauges may be used to evaluate the hydraulic connection between surface water bodies and the groundwater flow system and to determine the potential for sediment transport.

Soils and Sediments - The physical characteristics of the site soils and aquatic sediments will be evaluated. Some elements of this investigation may overlap with the hydrogeology and the hydrology investigations.

~~The Migration Pathway Assessment will culminate in the preparation and submittal of a Technical Memorandum describing the findings of the assessment. This memorandum will contain specific recommendations for the location and design of monitoring stations (i.e., wells, air quality samplers, surface water samplers, etc.).~~

~~e. Contaminant Characterization~~

~~Data generated from the Pathway Assessment and Source Characterization will be used to design an environmental sampling and analyses program. The objective of this program is to evaluate the extent and magnitude of contaminant migration along the pathways of concern at the Eagle Zinc Company Site.~~

~~Monitoring points will be installed in each media previously identified as a migration pathway. This monitoring network may incorporate several of the piezometers and/or gauges installed during the Pathway Assessment.~~

~~The analytical parameters list used in this subtask will be based on the data collected during the source characterization. The selection of parameters or classes of parameters (i.e., volatile organics, metals, PCBs/pesticides, etc.) will be based upon their source concentration and their persistence and mobility within the most likely pathway of migration. Provisions will be made for conducting Target Compound List (TCL) and Target Analyte List (TAL) analyses at those monitoring stations where there is a reasonable anticipation of detecting a complex contaminant profile. All samples will be collected, handled, and analyzed in accordance with the protocols and procedures described in the site QAPP.~~

~~Provisions will be made for conducting additional site investigation activities after the completion of the Remedial Alternatives Screening (Task 7). These supplemental investigations are intended to further characterize the sources, pathways, and/or contaminants and to satisfy the specific data requirements of the applicable remedial actions. The Plans for these investigations and the Bench/Pilot Studies (Task 4) will be prepared and submitted for Agency comment and approval after the completion of Task 7.~~

TASK 3 - SITE INVESTIGATION ANALYSES

An analyses of all data collected during this investigation will be made to assure that the quality (e.g., QA/QC procedures have been followed) and quantity of data adequately support the Risk Assessment and FS. The results of the site investigations will be organized and presented in the two technical memoranda and the Remedial Investigation Report ~~a report that summarizes the type and extent of on-site contamination and submitted to U.S. EPA and IEPA as the Preliminary Data Transmittal.~~

TASK 4 - BENCH/PILOT TESTING STUDIES

Bench and piloting scale testing studies will be performed as necessary to determine the applicability of selected remedial technologies to site specific conditions. These may include treatability ~~and cover~~ studies, aquifer testing, and/or material compatibility testing. These studies will be conducted in the later stages of the RI after the initial screening of remedial technologies and actions.

TASK 5 - REPORTS

1. Progress Reports

Monthly progress reports will be prepared to describe the technical progress of the RI. These reports shall be submitted to the U.S. EPA and IEPA by the tenth business day of each month, following the effective date of the Consent Order. ~~commencement of the work detailed in the RI/FS Work Plan~~. The monthly progress reports shall include the following information:

- All sampling and testing results and all other raw data produced during the month pursuant to the implementation of the Consent Order;

- A description of activities completed during the past month pursuant to the Consent Order, as well as such actions and plans that are scheduled for the next month pursuant to the Consent Order;

- A description of difficulties encountered during the reporting period and the actions taken to rectify the problems;

- Target and actual completion dates for each element of activity, including the project completion, and an explanation of any deviation from the schedules provided in the RI/FS Work Plan; and

- Changes in key personnel.

2. Technical Memorandums

The results of specific remedial investigation activities such as the Migration Pathway Assessment, Source Characterization, Risk Assessment, etc., will be submitted in draft form to the U.S. EPA and IEPA throughout the RI process. All responses to U.S. EPA and IEPA

comments concerning memorandum issues will be addressed in letters from the Respondent Project Coordinator to the U.S. EPA Remedial Project Manager and will be summarized in the draft RI report. The specific technical memorandums and their associated schedule of submittal have been identified above and will also be identified in the project Work Plan (Task 0).

3. Remedial Investigation Report

A final report covering the remedial investigations, the Remedial Investigation Report (RI), will be prepared. The RI will characterize the site and summarize the data collected and the conclusions drawn from investigative Tasks 1 through 3. The report will be submitted in draft form for review and approval pursuant to the terms of the Consent Order. The RI will not be considered final until a letter of approval is issued by the U.S. EPA Remedial Project Manager.

TASK 6 - COMMUNITY RELATIONS SUPPORT

A community relations program will be implemented ~~jointly~~ by the U.S. EPA, in consulation with ~~and~~ the IEPA. The responsible parties will cooperate with the U.S. EPA and the IEPA in providing RI/FS information to the public. The responsible parties will, at the request of the U.S. EPA, participate in the preparation of information distributed to the public, such as fact sheets, and in public meetings that may be held or sponsored by the U.S. EPA to describe activities at, or concerning, the site, including the findings of the RI/FS.

Community relations support will be consistent with Superfund community relations policy as stated in the "Guidance for Implementing the Superfund Program" and Community Relations in Superfund - A Handbook.

****

III.

FEASIBILITY STUDY

A. Scope

The purpose of the FS is to develop alternative remedial actions, based upon the results of the RI, that will mitigate impacts to public health and welfare and the environment.

The FS will conform to Section 121 of CERCLA (42 U.S.C. § 9621), the NCP as amended, the FS Guidance as amended, and other relevant written U.S. EPA policy and guidance. The FS is comprised of four tasks:

Task 7: Remedial Alternatives Screening
Task 8: Remedial Alternatives Evaluation
Task 9: Feasibility Study Report
Task 10: Additional Requirements

The intent and purpose of each of these tasks is outlined in the following sections; the technical approach and schedule is detailed in the RI/FS Work Plan (Task 0). To the extent practical, the FS shall follow the presumptive remedy guidance for metals in soils and any other appropriate presumptive remedy guidance (Tom-does this limit us?) US EPA anticipates that, subject to the results of the RI, this site may be a candidate for application of ~~the~~ USEPA's presumptive remedy guidance for metals in soils. The FS should take that guidance into account in preparing & developing the tasks described below

B. Tasks

TASK 7 - REMEDIAL ALTERNATIVES SCREENING

This task constitutes the first stage of the FS and is comprised of six interrelated subtasks. The goal is to develop and evaluate remedial alternatives for additional screening and evaluation. The Public Health Evaluation results will be considered throughout the evaluation process.

Subtask 7A - Preliminary Remedial Technologies

A master list of potentially feasible technologies will be developed that includes both on-site and off-site remedies. The master list will be screened according to site conditions, waste characteristics, and technical requirements, in order to eliminate or modify those technologies that may prove extremely difficult to implement, require unreasonable time periods, or rely on insufficiently developed technology. Emerging technologies being evaluated through the U.S. EPA's Site Program will also be considered if that information is available. The results of this task will be summarized in a Technical Memorandum that will be submitted to the U.S. EPA and the IEPA.

Subtask 7B - Development of Alternatives

1. Developing Remedial Response Objectives

   Develop site-specific objectives based on public health and environmental concerns for the Eagle Zinc Company Site, the description of the current situation, information gathered during the RI, Section 300.68 of the National Contingency Plan (NCP), U.S. EPA's interim guidance, and the requirements of any other applicable U.S. EPA, Federal, and State environmental standards, guidance and advisories as defined under Section 121 of CERCLA. Preliminary cleanup objectives will be developed under formal consultation with the U.S. EPA and IEPA.

2. Assembling Alternatives for Remedial Actions

   Develop a comprehensive, site-specific approach for Remedial Action by assembling combinations of identified technologies that include the following:

   a. Treatment alternatives for source control that eliminate the need for long-term management (including monitoring).

   b. Alternatives involving treatment as a principal element to reduce the toxicity, mobility, or volume of waste.

   Develop at least two additional alternatives that include the following:

   c. An alternative that involves containment of waste with little or no treatment but protects human health and the environment primarily by preventing exposure to, or reducing the mobility of, the waste.

d. A no action alternative.

For groundwater response actions, a limited number of remedial alternatives will be developed within a performance range defined in terms of a remediation level. The targeted remediation level is the risk range of 10^{-4} to 10^{-7} for maximum lifetime risk and includes different rates of restoration. If feasible, one alternative that would restore groundwater quality to a 10^{-6} risk for maximum lifetime risk level within five years will be configured.

The remedial action alternatives developed for the Eagle Zinc Company Site may involve both source control and groundwater response actions. In these instances, the two elements may be formulated together so that the comprehensive remedial action is effective and the elements complimentary. Because each element has different requirements, each will be detailed separately in the development and analyses of alternatives.

Subtask 7C - Initial Screening of Alternatives

1. Initial Screening Considerations

The alternatives developed under Subtask 7B will be subjected to an initial screening to narrow the list of potential remedial actions for detailed analyses; the rationale for eliminating alternatives will be included. Initial screening considerations include:

a. Effectiveness - degree to which the alternative to protects human health and the environment; attains Federal and State Applicable or Relevant and Appropriate Requirements (ARARs) or other applicable criteria, advisories, or guidance; significantly and permanently reduces the toxicity, mobility, or volume of the hazardous constituents and are technically reliable and effective in other respects. Reliability considerations include the potential for failure and the need to replace the remedy.

b. Implementability - degree to which the alternatives is technically feasible and employs available technologies; the technical and institutional ability to monitor, maintain, and replace the technology over time, and the

administrative feasibility of implementing the alternative.

c. Cost - evaluation of construction and long-term costs to operate and maintain the alternative based on conceptual costing information. At this stage of the FS, cost will be used as a factor when comparing alternatives that provide similar results, but not when comparing treatment and non-treatment alternatives. Cost will, however, be a factor in the final remedial selection process, however as described in Subtask 8B, Section 1, paragraphs (c) and (d).

2. Intent of Alternatives Screening

The initial screening of alternatives incorporating treatment will be conducted with the intent of preserving the most promising alternatives as determined by their likely effectiveness and implementability further analyses. The screening should result in a range of alternatives remaining for further analyses as described previously in Subtask 7B(2).

Innovative alternative technologies will be carried through the screening if there is a reasonable belief they offer either the potential for better treatment performance or implementability, fewer or less adverse impacts than other available approaches, or lower costs for similar performance than the demonstrated technologies.

The containment and no-action alternatives will be carried through the screening process to the detailed analyses.

Subtask 7D - Community Relations Program

A program for community relations support will be developed. The program will be consistent with the Community Relations Program developed under Task 6 and with the conditions set forth in the Consent Order.

Subtask 7E - Data Requirements

Data requirements specific to the relevant and applicable technologies will be identified. These requirements will focus on providing data needed for the detailed evaluation and development of

a preferred alternative.

TASK 8 - REMEDIAL ALTERNATIVES EVALUATION

The contractor will conduct a detailed analysis of alternatives which will consist of an individual analysis of each alternative against a set of evaluation criteria and a comparative analysis of all options against the evaluation criteria with respect to one another.

The evaluation criteria are as follows:

Overall Protection of Human Health and the Environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with ARARs addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes and/or provide grounds for invoking a waiver.

Long-Term Effectiveness and Permanence refers to the ability or a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

Reduction of Toxicity, Mobility, or Volume Through Treatment is the anticipated performance of the treatment technologies a remedy may employ.

Short-Term Effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

Cost includes estimated capital and operation and maintenance costs, and net present worth costs.

State Acceptance (Support Agency) addresses the technical or administrative issues and concerns the support agency may have regarding each alternative.

Community Acceptance addresses the issues and concerns the public may have to each of the alternatives.

The individual analysis should include: (1) a technical description of each alternative that

outlines the waste management strategy involved and identifies the key ARARs associated with each alternative; and (2) a discussion that profiles the performance of that alternative with respect to each of the evaluation criteria. A table summarizing the results of this analysis should be prepared. Once the individual analysis is complete, the alternatives will be compared and contrasted to one another with respect to each of the evaluation criteria.

An alternative that is preferred, but does not meet the Federal or State public health or environmental ARARs, will be selected only when:

1. The alternative is an interim remedy and will become part of a more comprehensive final remedy that will meet the Federal and State ARARs.

2. Compliance with the ARAR will result in a greater risk to human health and the environment than the alternative options.

3. Compliance with the requirements is technically impractical.

4. The alternative will attain a standard of performance that is equivalent to that required under the otherwise applicable standard, requirement, or limitation through the use of another method or approach.

5. The State has not consistently applied or demonstrated the intent to consistently apply the requirement at other similar facilities across the state.

The evaluation of alternatives to select the appropriate remedy will, in addition to meeting the required findings in Section 300.68(h)(1) of the NCP and reflecting the preferences in Section 300.68(h)(2) of the NCP, also consider and weigh the full range of factors in Section 300.68(e)(2) of the NCP. The selected alternative will represent the best balance across all evaluation criteria.

TASK 9 - FINAL FS REPORT

The FS will be prepared in a draft report and submitted for review and approval pursuant to Section VI of the Consent Order. The FS report will not be considered final until a Notice of Completion is issued by the U.S. EPA pursuant to the Consent Order. Deliverables and technical memorandums prepared previously will be summarized and referenced in order to limit the size

of the report. The report will completely document the FS and the process by which the recommended remedial alternative was selected.

~~TASK 10 - ADDITIONAL REQUIREMENTS~~

Task 10 - RI/FS Schedule

Deliverable	Due Date
1. Draft Task 1 Preliminary site Evaluation Report	Within forty five days of the effective date of the Consent Order
2. Task 1 Report Review Meeting	Within fourteen days after receipt of Task 1 Report
3. Final Task 1 Preliminary Site Evaluation Report	Within fourteen days of receipt of Agency comments on draft report
4. Draft RI/FS Workplan	Within ninety days of the effective date of the Consent Order
5. RI/FS workplan review meeting	Within twenty one days of receipt of RI/FS workplan
5. Final RI/FS workplan	Within fourteen days of receipt of Agency comments on draft RI/FS workplan
6. Draft Phase 1 Source Characterization TM	Within eight weeks of EPA approval of final RI/FS workplan
7. Phase 1 TM Review Meeting	Within fourteen days after receipt of Phase 1 TM
8. Final Phase 1 Source Characterization TM	Within fourteen days of receipt of Agency comments on draft Phase 1 TM
9. Draft Phase 2 Migration Pathway Assessment TM	Within nine weeks of receipt of Agency approval of final Phase 1 TM

10. Phase 2 TM Review Meeting	Within fourteen days of receipt of Phase 2 TM
11. Final Phase 2 Migration Pathway Assessment TM	Within fourteen days of receipt of Agency comments on Draft Phase 2 TM
12. Draft Risk Assessment Report	Within three weeks of Agency approval of the Phase 2 TM
13. Risk Assessment Report Review Meeting	Within fourteen days of receipt of the draft risk assessment report
14. Final Risk Assessment Report	Within fourteen days of receipt of Agency comments on the draft Risk Assessment Report
15. Draft Remedial Investigation Report	Within three weeks of Agency approval of Final Risk Assessment Report
16. Remedial Investigation Report review meeting	Within fourteen days of receipt of draft RI report
17. Final RI Report	Within fourteen days of receipt of Agency comments on draft RI Report
18. Draft Feasibility Study Report	Within six weeks of Agency approval of final RI report
19. Feasibility Study Report review meeting	Within fourteen days of receipt of draft FS report
20. Final FS Report	Within fourteen days of Agency comments on Draft FS report

[This text replaces similarly numbered paragraphs in the Model Remedial Investigation/Feasibility Study Statement of Work.]

U.S. Environmental Protection Agency

Office of Site Remediation Enforcement

August, 2001

QA/QC INSERTS FOR RI/FS SOW

TASK 1 - SCOPING

Sampling and Analysis Plan (2.3.2)

The respondent will prepare a sampling and analysis plan (SAP) to ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and that the data meet DQOs. The SAP provides a mechanism for planning field activities and consists of a field sampling plan (FSP) and a quality assurance project plan (QAPP).

The FSP will define in detail the sampling and data-gathering methods that will be used on the project. It will include sampling objectives, sample location and frequency, sampling equipment and procedures, and sample handling and analysis. The QAPP will describe the project objectives and organization, functional activities, and quality assurance and quality control (QA/QC) protocols that will be used to achieve the desired DQOs. The QAPP will be prepared in accordance with "EPA Requirements for Quality Asurance Project Plans (QA/R-5)" (EPA/240/B-01/003, March 2001) and "EPA Guidance for Quality Assurance Project Plans (QA/G-5)" (EPA/600/R-98/018, February 1998). The DQOs will at a minimum reflect use of analytic methods to identifying contamination and remediating contamination consistent with the levels for remedial action objectives identified in the proposed National Contingency Plan, pages 51425-26 and 51433 (December 21, 1988). In addition, the QAPP will address sampling procedures, sample custody, analytical procedures, and data reduction, validation, reporting and personnel qualifications. Field personnel should be available for EPA QA/QC training and orientation where applicable. The respondent will demonstrate, in advance to EPA's satisfaction, that each laboratory it may use is qualified to conduct the proposed work. This includes use of methods and analytical protocols for the chemicals of concern in the media of interest within detection and quantification limits consistent with both QA/QC procedures and DQOs approved in the QAPP for the site by EPA. The laboratory must have and follow an

approved QA program. If a laboratory not in the Contract Laboratory Program (CLP) is selected, methods consistent with CLP methods that would be used at this site for the purposes proposed and QA/QC procedures approved by EPA will be used. The respondent shall only use laboratories which have a documented Quality Assurance Program which complies with ANSI/ASQC E-4 1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs," (American National Standard, January 5, 1995) and "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01-002, March 2001) or equivalent documentation as determined by EPA. If the laboratory is not in the CLP program, a laboratory QA program must be submitted for EPA review and approval. EPA may require that the respondent submit detailed information to demonstrate that the laboratory is qualified to conduct the work, including information on personnel qualifications, equipment and material specifications. The respondent will provide assurances that EPA has access to laboratory personnel, equipment and records for sample collection, transportation and analysis.